IT PROJECT EVALUATION

Project Tracking No.: E-006-FY03-DOT

Return on Investment Program Funding Application (FY 2003 Request)

This is an electronic template. Please enter your responses on this document. Only electronic submittals of this template will be accepted. Proposals submitted after the designated due date may not receive funding consideration.
FINAL AUDIT REQUIRED: The Enterprise Quality Assurance Office of the Information Technology Department is required to perform a final project outcome audit, after implementation, for all Pooled Technology funded projects.

SECTION I: PROPOSAL

Date: 5/25/01

Agency Name: Iowa Department of Transportation

Project Name: Linear Referencing System (LRS) Implementation Project FY 02, FY 03 and FY04

Expenditure Name:

Agency Manager: William Schuman

Agency Manager Phone Number / E-mail: (515) 233-7770 william.schuman@dot.state.ia.us

Executive Sponsor (Agency Director or Designee): Mark F. Wandro, Director

Request For ROI Application Waiver:

Agencies are required to complete this funding application when requesting funds for any project, any IT expenditure costing over $100,000, or any non-routine IT expenditure. If you feel there is compelling reason to waive this requirement, please provide (in the box provided below) a brief description of the project or expenditure, the budget amount, and a rationale for the waiver request. Until a decision is made regarding your waiver request, it is not necessary to complete any other portion of this application. The ITD Enterprise Quality Assurance Office will convey waiver request decisions within five working days of receipt.

Explanation: No waiver requested

A. Project or Expenditure Rationale

Is this project or expenditure necessary for compliance with a Federal standard, initiative, or statute? ☐ **YES** (If "YES," explain) ☒ **NO**

Explanation: This initiative will aid the DOT in reporting the status of the Iowa transportation infrastructure to regulatory agencies that require yearly reports. The DOT is currently doing the reporting, but this system will provide additional efficiencies and will help provide more accurate infrastructure assessments.

Is this project or expenditure required by State statute? ☐ **YES** (If "YES," explain) ☒ **NO**

Explanation: This initiative will aid the DOT in reporting the status of the Iowa transportation infrastructure to regulatory agencies that require yearly reports. The DOT is currently doing the reporting, but this system will provide additional efficiencies and will help provide more accurate infrastructure assessments.

Does this project or expenditure meet a health, safety or security requirement?
☐ **YES** (If "YES," explain) ☒ **NO**

Explanation: The creation of this system will provide underlying data integration that is required to aid in areas such as oversize and overweight truck permitting and crash analysis. These areas are safety related, and must have reliably integrated and timely data. The ability to accomplish the oversized vehicle permitting is enhanced and made more efficient by developing this system. The integrated data will provide a means for providing more up-to-date information, thus increasing safety without requiring large increases in staff. This system will enhance the timely dissemination of information about road construction sites, areas of hazardous travel, and congestion problems. The integration of this data will also make the crash analysis more useful, therefore allowing safety engineers to identify problem areas more reliably.

Is this project or expenditure necessary for compliance with an enterprise technology standard?
☐ **YES** (If "YES," explain) ☒ **NO**

Explanation: The implementation of the LRS takes the DOT closer to compliance with the many newly established technology standards. It is not required for compliance.

Is this project or expenditure consistent with meeting the goals and objectives of the State's strategic plans?
☒ **YES** (If "YES," explain) ☐ **NO**

Explanation: The State's strategic plan highlights the need for government to be more efficient and effective. The LRS provides a single source for collecting, integrating, and analyzing roadway referenced data for the DOT. This will allow the DOT to improve analysis based on the data we currently collect, will provide data structures that facilitate the creation of or support citizen's access to information (e.g., Construction Status Web Page), reduce data storage and maintenance redundancy, and provide a means to improve data access for decision makers. This will make the DOT more effective and efficient. This system will also help other organizations and agencies improve their processes by providing them better information and improving data access.

Is this a "research and development" project or expenditure? ☐ **YES** (If "YES," explain) ☒ **NO**

Explanation:

B. Project or Expenditure Summary

1. Provide a pre-project or pre-expenditure (before implementation) and a post-project or post-expenditure (after implementation) description of the impacted system or process. In particular, note if the project or expenditure makes use of information technology in reengineering traditional government processes.

Response: Most of the DOT's highway inventory and analysis data systems are currently driven by a specific area's needs and focused on data maintenance. The use, integration, and analysis of the data are limited to a few individuals with the necessary technical skills or technology to access the data. In most cases, the end-users request the desired data and it is produced for them. The implementation of the LRS provides the foundation for integrating the many inventory systems and provides a system architecture for making that data available to the end users.

The LRS Development Project (currently underway) involves the identification of needs, the design of the LRS and related systems, and the pilot testing of the design. Starting with the results of a national research project, National Cooperative Highway Research Program 20-27, Iowa DOT developed a design for both a transactional system to maintain the LRS, and a decision support environment, to provide end user access to the DOT's business data. Through this project, and the previously identified need to minimize impacts on the existing data maintenance systems, it was determined that the many disparate databases at the DOT should be integrated using an interoperable approach. What this means is that the transactional systems used to maintain the business data must be minimally impacted, but that their data will be made accessible through a central location called the GeoData Library (GDL). Since the data have a spatial component, particularly a linear location, it was determined that this would be the most effective method to provide the integration while minimizing impacts to the transactional systems. This strategy will provide the DOT increased efficiencies in data collection, data analysis, and decision-making; without forcing major reengineering efforts and costs to existing processes prior to benefits being realized. The LRS/GDL combination also introduces some new functionality that is currently unavailable to the DOT. This includes the ability to integrate the business data over time, a navigable road network to use in Advanced Traveler Information Systems (ATIS) and Intelligent Transportation Systems (ITS), and rigorously documented procedures for maintaining the linear referencing methods that are used in the DOT.

2. Summarize the extent to which the project or expenditure improves customer service to Iowa citizens or within State government. Included would be such items as improving the quality of life, reducing the government hassle factor, providing enhanced services, improving work processes, etc.

Response: The LRS is a foundation system that integrates and manages the temporal, locational and relational components of the business data. This system will provide the underlying structure that facilitates the development of better decision support applications. As part of the LRS Implementation Project, the DOT will build decision support applications that improve data accessibility for the internal DOT personnel. This will benefit the public by providing better information to the decision makers at Iowa DOT, and will also directly impact the public as new systems are developed for their direct use.

An example of direct public impact is the development of Intelligent Transportation Systems (ITS). Many of these applications require accurate spatial representations of the road network, and database modeled navigable networks to allow routing and other navigation. The LRS includes a single navigable network that will provide a road network source for many applications to use. As an example, a web application is currently under development to report road conditions, weather, and other incidents that impact motorists.

If Iowa DOT does not develop the LRS, it is likely that many application development efforts will redundantly create road data, integration methodologies and analysis tools. This will cost Iowans more in maintenance of these systems and make the data less integrated than can be realized from the completion of this project.

3. Identify the main project or expenditure stakeholders and summarize the extent to which each, especially citizens, is impacted. In particular, note if the project or expenditure helps reconnect Iowans to State government.

Response: The response is provided for each Iowa DOT Division and the Iowa public as a group.

In the Highway Division, the pavement, bridge, maintenance, safety, and laboratory management systems will all benefit from the integration of the different linear referencing methods (LRMs), such as mile posts, stationing, literal descriptions, and coordinate/route. In addition, the LRS will help the Division with its ITS (Intelligent Transportation System) requirements by providing better spatial accuracy, temporal information and route data. This will benefit the public by providing the decision makers better information and improve the DOT's ability to make informed decisions related to allocating highway funds to the areas of need.

For the Information Technology Division, the benefits include reduced data redundancy, a foundation architecture to support the development of the many systems being requested by the Divisions, and a documented, reusable approach for using the location components of the DOT data.

The Modal Division will benefit because of the LRS's ability to store public transit routes, and in the future, use features of the LRS to model multi-modal goods movement (rail, barge, or highway).

The Motor Vehicle Division can use the LRS to better locate crashes because of an improved road centerline database. The LRS navigable network will also assist this Division in permitting oversized and overweight truck routes. The network can automatically apply the road restriction information by using the LRS integration tools. For example, the narrow lane and bridge clearance restrictions can be used along with the network to provide the needed information for oversized truck permitting.

The benefits to the Planning and Programming Division include the ability to better integrate road data, analyze and report data such as the Needs and Sufficiency reports, provide transportation programming reports and maps, assist in the collection and management of roadway inventory data, perform trip generation analysis, and aid the Division's ITS needs.

The Public and other external entities will also benefit from the LRS. The LRS will facilitate more informed decisions at Iowa DOT because of improved data accessibly, integration, and presentation. Existing applications such as the Accident Location and Analysis System (ALAS) will have better located crashes and better-integrated data. ALAS is used by many cities and local jurisdictions. The LRS will also reduce data sharing efforts and allow for quicker development of public access points for information available in the DOT (Construction Status Web Page and Intelligent Transportation Systems).

SECTION II: PROJECT ADMINISTRATION

A. Agency Information

1. Project Executive Sponsor Responsibilities: The sponsor must have the authority to ensure that adequate resources are available for the entire project, that there is commitment and support for the project, and that the organization will achieve successful project implementation.

Response: No response required.

2. Organization Skills:
   a. List the project management skills necessary for successful project implementation
   b. List the project management skills available within the agency
   c. List the source(s) of project management skills lacking within the agency
   d. Summarize relevant agency project management experience and results

Response: Rigorous project management skills are needed for this project. The proposed project will involve significant budget administration, staff management, consultant coordination, and marketing skills to keep the project on schedule, under budget and fully supported. The project management skills proposed for this project are:

> Iowa DOT Project Manager
a.) A project manager will be assigned to this project to ensure its success. This person will manage the relationship between the consultants and the DOT. This person will also be responsible for budget tracking, identifying needed DOT staff, and risk assessment.
b.) Iowa DOT has the skills needed for this position and has identified a person to fill this role.
c.) None needed
d.) Project management skills exist from the many IT projects the DOT does and from individuals hired by the DOT that have managed projects in the private sector IT industry. Results on the previous LRS project were good.

> Project Implementation Manager
a.) This is a full time person that will be responsible for the daily operations of the project and ensure the logistical details are in order. This person will serve as a first line contact for daily project management, but will meet regularly with the Iowa DOT Project Manager to ensure that the necessary issues are resolved.
b.) Personnel with these skills exist at the DOT, but are allocated in other areas.
c.) A consultant will fill this role.

> Project Team Leaders
a.) These team managers will be responsible for the various areas assigned or contracted to them.
b.) Personnel with these skills exist at the DOT, but are allocated in other areas.
c.) Most of these managers will be consultants since the primary development work will be done by consultants.

B. Project Information

1. History:
   a. Is this project the first part of a future, larger project? If so, please explain.
   b. Is this project a continuation of a previously begun project? If so, please explain project history, current status, and results.

Response:

a.) This is a continuation project.
b.) In April 1999, the Iowa Department of Transportation (DOT) began a project to develop a Linear Referencing System (LRS). The linear reference system's primary purpose is to improve Iowa DOT business workflows and decision-making by improving the integration of disparate data using the data's linear locations as the common link. The data's linear location is described in terms of a linear reference method (LRM). LRMs are used to locate transportation objects (signs, pavement) and events (crashes, traffic collection sections) relative to a position along a transportation feature (a roadway). Referencing transportation objects by milepost is an example of a DOT LRM.

The LRS is composed of people, data, tools, policies and technology that together will be a key element to DOT's data integration, analysis, and decision-making. Access to the LRS primarily will be through DOT's single data access environment called the GeoData Library. The LRS, through the GeoData Library, will support both formal applications (e.g., pavement management) and ad hoc queries and analyses.

Iowa DOT contracted with GeoAnalytics, Inc. to provide counsel, facilitate Department decisions and provide technical support services for the LRS Project. The Project Team assigned to this project is composed of both GeoAnalytics and Iowa DOT staff. A Project Steering Committee composed of representatives from DOT Divisions guides the Project Team.

The current proposed project, the Iowa DOT LRS Implementation Project, is divided into four initiatives. Initiative #1 begins in June of 2001. Initiatives #2 - #4 are scheduled to be completed in subsequent years, and in some instances the projects run concurrently. Full implementation is anticipated before the end of FY04.

2. Expectations: Describe the primary purpose or reason for the project.

Response: The primary purpose of the LRS Implementation Project is to develop an underlying foundation system that will facilitate the integration of Iowa DOT's business data and provide a set of tools that allow Iowa DOT personnel to use the integrated data efficiently. Many data integration, access, and accuracy needs are currently not met. This system will provide the means to meet all these needs, plus address requirements that are being identified as new systems are being developed.

3. Measures: Describe the criteria that will be used to determine if the project is successful.

Response: The success of the LRS Implementation project will be measured by showing a significant increase in the ability to integrate data, a decrease in the effort expended to integrate data, increased data accessibility, and less redunancy in data maintenance and development of business data analysis tools.

4. Environment: List the project participants (i.e. single agency, multiple agencies, State government enterprise, citizens, associations, or businesses, etc.).

Response: The project participants include all divisions of the Iowa DOT, other state agencies (potentially Emergency Management), and portions of local government (county, city).

5. Risk: Describe the project risks which may be internal or external to State government, i.e. implementing versus not implementing project, changing technology, potential cost overruns, changing citizen demand or need, etc.

Response: The largest risk is to not develop this project. The end user applications that are necessary for Iowa DOT require this type of foundation system. If the LRS is not developed, individual projects/applications will find ways to meet the unmet requirements, and redundancy and uncoordinated development is sure to occur. This costs the public more for technology, staffing and consulting services.

Another risk is the current budget and staffing reductions requested of all state agencies. Implementation of new systems takes money and staff. With shrinking budgets, the staff needed to get to the point of showing benefit may be unavailable or very difficult to find.

6. Security / Data Integrity / Data Accuracy / Information Privacy
   a. List the security requirements of the project
   b. Describe how the security requirements will be integrated into the project and tested
   c. Describe what measures will be taken to insure data integrity, data accuracy and information privacy.

Response: a.) Data integrity and accuracy is the primary concern for this system. Standard information privacy and security issues will be addressed, but no special requirements are anticipated.

b.) The design and testing of the security will be done as part of the project. Integration of security will be determined as the applications are designed. Testing for security will be part of the testing phase of project.

c.) The new LRS Data Maintenance tool will be developed to ensure the newly designed LRS Database will not be corrupted or loose its accuracy. The database has been designed using standard industry practices (normalized data structures) so referencial integrity will be maintained at application and database levels. The project implementation strategy includes staffing and system needs to ensure the data is maintained on an ongoing basis and that it will not become antiquated after the intial data development effort.

7. Project Schedule
   Describe general time lines, resources, tasks, checkpoints, deliverables, responsible parties, etc.

Response: The implementation of the LRS is broken into 4 Initiatives to be completed in the summer 2004. Each Initiative is composed of several projects that create LRS data, applications to maintain the LRS data, and end user business applications that use the LRS DOT business data.

Initiative 1 – June 2001 to March 2003
Initiative 2 – October 2002 to October 2003
Initiative 3 – April 2003 to April 2004
Initiative 4 – January 2004 to June 2004

The Initiative approach spreads the cost of creating the LRS over the next 3 years and creates applications that maintain and apply the LRS. Each Initiative builds on already completed efforts so that knowledge and lessons learned can improve subsequent project work. The main deliverables are:

> A comprehensive application to maintain the LRS database
> A fully populated LRS database for the entire set of Iowa pubic roads
> A fully functional Application Program Interface (API) to facilitate the development of end user applications
> Development of the staging processes to take LRS and business data into the GeoData Library (GDL)
> An initial set of end user applications
> A fully documented set of procedures and practices for using the LRS, including knowledge transfer and training

A comprehensive Project Task list and resource allocation plan is available in Microsoft Project format, but is beyond the scope of this document. A document detailing the Implementation Strategy is also available at: http://www.dot.state.ia.us/gis/lrs_project.htm.

SECTION III: TECHNOLOGY (In written detail, describe the following)

A. Current Technology Environment

1. Software (Client Side / Server Side / Midrange / Mainframe):
   a. Application software
   b. Operating system software
   c. Major interfaces to other systems, both internal and external

Response: The current technology environment is varied and diverse. Some maintenance systems are mainframe based, others are PC applications. The database software varies from IDMS, to Oracle, to MS Access. The main operating system software used is Microsoft Windows NT/2000. A full written description of all the systems related to this project would be extensive since it impacts the entire enterprise.

2. Hardware (Client Side / Server Side / Mid-range / Mainframe):
   a. Platform, operating system
   b. Storage and physical environment
   c. Connectivity and bandwidth
   d. Logical and physical connectivity
   e. Major interfaces to other systems, both internal and external

Response: The hardware environment is varied. The main platform used for the various databases is Intel processor based, with Windows as the primary OS. An IBM server, hosting IDMS, is also used to store some information relavent to the LRS. The DOT LAN is a combination of Ethernet and Token Ring and meets most needs for the currently identified projects.

The LRS is a new system that may be beneficial to several current data maintenance applications. Due to the fact it is a new system, and is built upon an interoperable architecture, the impact to current systems are minimized, because the LRS will not replace these systems, only faciliate the integration of the data contained within the disparate databases.

B. Proposed Technology Environment

1. Software (Client Side / Server side / Mid-range / Mainframe)
   a. Application software
   b. Operating system software
   c. Major interfaces to other systems, both internal and external
   d. General parameters if specific parameters are unknown or to be determined

Response: A comprehensive technical environment discussion is provided in the Physical Design Technical Document and updated in the Redesign Technical Document at: http://www.dot.state.ia.us/gis/lrs_project.htm

2. Hardware (Client Side / Server Side / Mid-range / Mainframe)
   a. Platform, operating system
   b. Storage and physical environment
   c. Connectivity and Bandwidth
   d. Logical and physical connectivity
   e. Major interfaces to other systems, both internal and external
   f. General parameters if specific parameters are unknown or to be determined

Response: A comprehensive technical environment discussion is provided in the Physical Design Technical Document at: http://www.dot.state.ia.us/gis/lrs_project.htm

C. Data Elements

If the project creates a new database, provide a description of the data elements.

Response: The LRS database is based upon the concept of a datum as the common underlying component. The datum is made up of anchor sections, anchor points, and several other elements that track the history of the anchor sections.

The datum is related to the network components using linear conflation objects that are stored in Oracle. The network is made up of transport nodes and transport links.

The route elements use the network elements to develop the many different route types that are necessary for the DOT business requirments Several linear referencing methods (LRMs) are built upon the route and network elements; these LRMs are used to integrate and relate many exisiting DOT enterprise data sets.

Spatial (map) information is stored for these components in Oracle Spatial.

A comprehensive data model and data dictionary is available in the Physical Design Database Model at: http://www.dot.state.ia.us/gis/lrs_project.htm

SECTION IV: Financial Analysis

A. Budget: Enter figures and calculate (see formula below) Total Annual Prorated Cost (State Share).

$$\left[\left(\frac{Budget\ Amount}{Useful\ Life}\right)\times \%\ State\ Share\right]+\left(Annual\ Ongoing\ Cost\times \%\ State\ Share\right)=Annual\ \mathrm{Pr}orated\ Cost$$

Budget Line Items	Budget Amount (1st Year Cost)	Useful Life (Years)	% State Share	Annual Ongoing Cost (After 1st Year)	% State Share	Annual Prorated Cost
Agency Staff	$403200	10	100%	$604800	100%	$645120
Software	$117000	10	20%	$58000	20%	$16280
Hardware	$137000	4	20%	$84000	20%	$23650
Training	$66500	4	20%	$10000	20%	$5325
Facilities	$	1	%	$	%	$
Professional	$2063500	10	20%	$	%	$41270

Services									
ITD Services	$		4		%	$		%	$
Supplies, Maint, etc.	$31000 (Travel)		1		100%	$		%	$31000
Other (Specify)	$		1		%	$8000		100%	$8000
Totals	$2818200		-------		-------	$764800		------	$770645

Transfer this amount to the ROI Financial Worksheet, item “D” on page 17.

B. Funding: Enter data or provide response as requested

1. This is (pick one):
   - ☐ A Pooled Technology Fund or Reengineering Fund Request
   - ☐ An Agency IT Expenditure or Budget Request (General Fund, Road Funds, etc)
   - ☒ Other – Specify: Federal SPR, ITS, and Federal Management Systems Funds.

2. On a fiscal year basis, enter the estimated cost by funding source?

	FY03		FY04		FY05	
	Cost ($)	% Total Cost	Cost ($)	% Total Cost	Cost ($)	% Total Cost
State General Fund	$	%	$	%	$	%
Pooled Tech. Fund	$	%	$	%	$	%
Federal Funds	$1567600	80%	$1296800	80%	$	%
Local Gov. Funds	$	%	$	%	$	%
Grant or Private Funds	$	%	$	%	$	%
Other Funds (Road Use Tax Fund)	$391900	20%	$324200	20%	$	%
Total Project Cost	$1959500	100%	$1621000	100%	$	100%

If applicable, summarize prior fiscal year funding experience for the project / expenditure.

Response: The LRS Development Project total cost (not including staff) was $651,840 and was funded from May 1999 to May 2001. This was funded from matching funds at 80% Federal and 20% State.

1. On a fiscal year basis, how much of the total ($ amount and %) project / expenditure cost would be absorbed by your agency from normal operating budgets (all funding sources)?

Response: The agency staff will be the primary cost absorbed by the DOT. It is expected that the staff will be used to aid in the upgrading and updating of legacy systems, as well as new system development and maintenance. All costs are absorbed at some level because the money used for this project will not be available for use in other projects needed within the DOT. A prioritized list of projects was created, and the DOT determined to expend its available funding on this project.

2. Identify, list, and quantify all new annual ongoing (maintenance, staffing, etc.) related costs (State $s) that will be incurred after implementation or expenditure.

Response: Hardware Costs - It is anticipated that the ongoing hardware costs to maintain the LRS after implementation will be $84,000. This includes items such as replacing workstations for maintaining the LRS, server maintenance costs, data collection hardware (Global Positioning Systems and Distance Measuring Instruments), and collaboration equipment (digital computer cameras). The DOT anticipates that some of the hardware will be used to support other DOT applications beyond the LRS.

Software Costs - It is anticipated that ongoing software costs to maintain the LRS after implementation will be $58,000. This includes primarily maintenance agreements for the software purchased as part of the project. Software maintenance on Oracle, Oracle Spatial, LRSx, and GeoMedia Web Map are examples of software packages used by the LRS. The costs of maintaining these packages already used in the DOT for other applications are NOT included in the LRS estimate. For example, the map development process currently uses Oracle. The maintenance for those licenses will be used for the LRS, so they are not included.

Staff Costs - It is anticipated that approximately 12 FTEs will be necessary to operate, maintain, and manage the LRS. These FTE are identified as necessary for the LRS, but this does not include the expected business reengineering processes that may make some tasks obsolete once the LRS is developed. In addition, many of the tasks required by the LRS are already being done in the DOT, so only a portion of the 12 FTE is additional staff. The anticipated cost for the 12 FTE is approximately $480,000 + 26% overhead, totaling $604,800. It is estimated that approximately 25% of this cost is new expenditure to things better or to do new things. The added cost is therefore - $151,200

C. ROI Financial Worksheet: **Respond to the following and transfer data to the ROI Financial Worksheet (see IVC11) as necessary:**

1. Annual Pre-Project Cost – Quantify all actual state government direct and indirect costs (personnel, support, equipment, etc.) associated with the activity, system or process prior to project implementation. This section should be completed only if state government operations costs are expected to be reduced as a result of project implementation.

Response: The development of the LRS will provide a means for data integration using an interoperable architecture model. This was done because direction was given to the LRS design team to minimize impacts on maintenance systems when developing the LRS. This was done to lower the costs of redeveloping all the numerous data maintenance applications. This means that very little business process reengineering (BPR) was done for the maintenance applications. A top down approach to reengineering enterprise-wide systems was not taken. The LRS will provide an architecture that can accommodate a top down BPR process in the future. It is expected that certain data maintenance processes may be reengineered to utilize the LRS and that the reengineering will offset the cost of building and maintaining the LRS.

Because this is a foundation system and touches so many elements of the DOT's IS processes, quantifying the pre-project costs would be a daunting task. It is expected, however, that as processes improve and the LRS is integrated into the DOT data environment, that operations costs will be reduced. These savings will likely be used to provide better services to internal government and external (public) customers.

2. Annual Post-Project Cost – Quantify all estimated State government direct and indirect costs associated with activity, system or process after project implementation. This section should be completed only if State government operations costs are expected to be reduced as a result of project implementation.

Response: For the reasons stated above, operating cost estimates are very difficult to estimate. The costs listed are based on the anticipated costs with little or no process improvement. The DOT data system managers will see the benefits from the LRS data integration and enterprise access environment. As part of more integration with the LRS, BPR efforts will be explored. As each business system's processes are reviewed, continual benefits will be recognized.

3. State Government Benefit -- Subtract the total "Annual Post-Project Cost" from the total "Annual Pre-Project Cost." This section should be completed only if State government operations costs are expected to be reduced as a result of project implementation.

Response:

4. Citizen Benefit – Quantify the estimated annual value of the project to Iowa citizens**.** This includes the "hard cost" value of avoiding expenses ("hidden taxes") related to conducting business with State government. These expenses may be of a personal or business nature. They could be related to transportation, the time expended on or waiting for the manual processing of governmental paperwork such as licenses or applications, taking time off work, mailing, or other similar expenses. As a "rule of thumb," use a value of $10 per hour for citizen time savings and $.325 per mile for travel cost savings.

Response:

5. Opportunity Value/Risk or Loss Avoidance Benefit – Quantify the estimated annual non-operations benefit to State government. This could include such items as qualifying for additional matching funds, avoiding the loss of matching funds, avoiding program penalties/sanctions or interest charges, avoiding risks to health/security/safety, avoiding the consequences of not complying with State or federal laws, providing enhanced services, avoiding the consequences of not complying with enterprise technology standards, etc.

Response: The development of the LRS will provide the means to make better decisions about the roads that the traveling public relies on every day. The safety of the users of the transportation system is the most important aspect of the DOT's management and operation of the road networks. Quantifying the loss avoidance that the LRS may contribute could be in the multiple millions of dollars if property damage and fatal crashes are avoided. A single fatality is equated to between a $1,000,000 (Iowa Average) & $1,800,000 (National Average) loss, major injuries are equated to approximately a $150,000 loss. For every life lost that the LRS helps prevent through quicker and better decision making, it justifies a significant portion of its financial needs.

The opportunity benefits of developing the LRS are numerous, but one main opportunity is for the DOT to create an environment that is scalable and rigorously designed around enterprise needs. Current inventory and asset management systems are focused on very specific areas of need, thus making enterprise use of the data limited. This limits not only the DOT's ability to use the data efficiently and effectively, but also causes potential financial loss and safety for the public.

6. Total Annual Project Benefit -- Add the values of all annual benefit categories.

Response: At this time, the benefits are mostly qualitative or long term, but savings will be recognized by implementing the LRS.

7. Total Annual Project Cost – It is necessary to estimate and assign a useful life figure to each cost identified in the project budget. Useful life is the amount of time that project related equipment, products, or services are utilized before they are updated or replaced. In general, the useful life of hardware is three (3) years and the useful life of software is four (4) years. Depending upon the nature of the expense, the useful life for other project costs will vary between one (1) and four (4) years. On an exception basis, the useful life of individual project elements or the project as a whole may exceed four (4) years. Additionally, the ROI calculation must include all new annual ongoing costs that are project related. Completing

Section IV-A, Project Budget of the evaluation document will provide all the necessary information for this item.

Response: See Section IV-A.

8. Benefit / Cost Ratio – Divide the "Total Annual Project Benefit" by the "Total Annual Project Cost." If the resulting figure is greater than one (1.00), then the annual project benefits exceed the annual project cost. If the resulting figure is less than one (1.00), then the annual project benefits are less than the annual project cost.

Response:

9. ROI -- Subtract the "Total Annual Project Cost" from the "Total Annual Project Benefit" and divide by the amount of the requested State IT project funds.

Response:

10. Benefits Not Readily Quantifiable -- List the project benefits which are not readily quantifiable (i.e. IT innovation, unique system application, utilization of new technology, hidden taxes, improving the quality of life, reducing the government hassle factor, meeting a strategic goal, etc.). Rate the importance of these benefits on a "1 – 10" basis, with "10" being of highest importance. Check the "Benefits Not Readily Quantifiable" box in the applicable row.

Response: The benefits that are not readily quantifiable are numerous.
1.) If Iowa DOT does not build the LRS, many of the systems planned or currently under development will build part of the LRS functionality into their applications anyway. This cost is difficult to quantify because many of the systems are planned systems and the extent of the potential duplication and redundancy is unknown. If the LRS is not built, it is very likely that the development efforts will be disjointed and will cost the DOT significantly in lost integration and extra development. (Ranking 10)

2.) The need to stay relatively current with technology and current practices is significant for many reasons. First the ability for the DOT to continue to migrate to newer technologies can be held back by static systems. For example, some applications cannot be easily integrated because of platform and operation system dependencies. (Ranking 8)

Second, attracting and retaining new staff is difficult if the systems we have are old and unfamiliar to technically skilled personnel. User frustration with the IT staff gets higher when the users know that solutions exist, but are not deployed because the IT architecture prevents the deployment of such solutions. (Ranking 6)

Last, new technologies and problem solving methods become available every month. It is necessary to look at these new methods for approaching existing IT problems (data integration) and break into new practices that provide the solutions. The LRS uses a nationally recognized conceptual data model for linear data and leverages research that the National Cooperative Highway Research Program completed. (Ranking 5)

3.) The Federal Government legislated the development of Transportation Management Systems in the Intermodal Surface Transportation Efficiency Act (ISTEA). For a period of time, these systems were mandated and had to be built to receive federal funding. This was done to make DOTs more accountable for the decisions they make related to the use of funds provided for highway and related construction. Under the TEA21, these systems are no longer mandated, but many of the DOTs across the country have seen the benefits of deploying these systems. The LRS will provide the ability to integrate the data in these traditional transportation management systems, and allow better information to be extracted from the large number of databases currently maintained. This will allow tax dollars to be more wisely spent, in the areas that are in the most need, and that can help the most citizens. (Ranking 10)

4.) The implementation of new functionality (e.g., a navigable network) and accuracy (e.g., better maps and distances) also provide benefits that are not readily quantifiable. New systems require the new LRS data models, accuracy, and functionality; but placing a dollar value on the proposed creation of the new functionality is difficult because it supports many systems and development efforts. (Ranking 9)

11. ROI Financial Worksheet

Annual Pre-Project Cost - How You Perform The Function(s) Now	
FTE Cost (salary plus benefits):	$
Support Cost (i.e. office supplies, telephone, pagers, travel, etc.):	$
Other Cost (expense items other than FTEs & support costs, i.e. indirect costs if applicable, etc.):	$
A. Total Annual Pre-Project Cost:	$
Annual Post-Project Cost – How You Propose to Perform the Function(s)	
FTE Cost:	$
Support Cost (i.e. office supplies, telephone, pagers, travel, etc.):	$
Other Cost (expense items other than FTEs & support costs, i.e. indirect costs if applicable, etc.):	$
B. Total Annual Post-Project Cost:	$
State Government Benefit (= A-B):	$
Annual Benefit Summary	
State Government Benefit:	$
Citizen Benefit:	$
Opportunity Value or Risk/Loss Avoidance Benefit:	$
C. Total Annual Project Benefit:	$
D. Annual Prorated Cost (SECTION IV-A):	$
Benefit / Cost Ratio: (C / D) =	
Return On Investment (ROI): (C – D / Requested Project Funds) x 100 =	**%**
☒ **Benefits Not Readily Quantifiable**	

Section V: ITC Project Evaluation Criteria

Criteria and Location in Project Evaluation Document		Points
1.	Is the project a statutory requirement; legal requirement; federal or state mandate; health, safety or security requirement or issue; and/or required for compliance with the enterprise technology standards? **Location: Section I-A**	**15**
2.	Will the project improve customer service? **Location: Section I-B.2**	**15**
3.	Does the project have a direct impact on citizens? To what extent does the project help reconnect state government with Iowans? **Location: Section I-B.3**	**10**
4.	Does the project provide a sufficient tangible and/or intangible return on investment? Will it generate savings or income? **Location: Section IV-C**	**10**
5.	Does the project make use of information technology and its practical application in reengineering traditional government processes consistent with the goals and objectives of the state's strategic plans? **Location: Section I-B.1**	**10**
6.	Risk: What are the risks associated with the project? Such risks may include those internal and external to state government, the risk of doing a project, the risk of not doing a project, and the risks associated with changing technologies, potential cost overruns, and changing citizen demands and needs. **Location: Section II-B.5**	**10**
7.	Is this funding required to continue a project that was begun prior to the year funding is being requested for and does it have proven past performance? Is the funding part of a multi-year strategy? **Location: Section II-B1, IVB2**	**10**
8.	Will the project be for only one agency, multiple agencies, or the state government enterprise? **Location: Section I-B3, IIB4**	**10**
9.	Has the applicant maximized their own and other resources in the project? Is alternative funding unavailable for this project? (If no other funding available, project will not be completed without Pooled Technology funding) **Location: Section IV-B.2, IV-B.3**	**5**
10.	What is the credibility of the requester based on past performance on other projects? **Location: Section II-A.2.d**	**5**
	Total	**100**